How to get more Mix in your Mixed Liquors

The Strength of Diversity in Wastewater
HELLO!

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Agenda

1. What is diversity?
2. The state of diversity in the field of water.
3. Why is it important?
4. What are the benefits?
5. Flint, MI Case Study
6. What can you do?
Diversity is the variability among living organisms from all sources and the ecological complexes of which they are a part; this includes diversity within species, between species and of ecosystems.
Wastewater needs diversity in organisms for optimal treatment
The concept of diversity encompasses acceptance and respect. It means understanding that each individual is unique, and recognizing our individual differences. These can be along the dimensions of race, ethnicity, gender, sexual orientation, socio-economic status, age, physical abilities, religious beliefs, political beliefs, or other ideologies. It is the exploration of these differences in a safe, positive, and nurturing environment. It is about understanding each other and moving beyond simple tolerance to embracing and celebrating the rich dimensions of diversity contained within each individual.
Types of Diversity

- Age
- Racial
- Sex/Gender
- Education
- Socio-economic
- Background
Social Capital

Diversity

Values, Norms, Outlook in Life

Citizen Power

Participation

Sense of Belonging

Networks Bonding Bridging

Feelings of Trust & Safety

Reciprocity
By the numbers...

Nearly **1.7** million workers fill jobs in utilities, construction firms, and numerous other employers across the water sector.

Water workers, including water treatment operators, are almost four years older than the national median age (42.2 years old) across all occupations.

Women make up only **14.9** percent of the water workforce, compared to **46.8** percent of all workers nationally.

Black and Asian workers only represent **11.5** percent of the water workforce, compared to **18** percent of all workers nationally.

Water sector pay well — not only on average — but also up to **50** percent more to workers at the lower end of the income scale.

Just **10.2** percent of water workers are under the age of 24, compared to **12.5** percent of all workers nationally.

BLS also projects water occupations to see faster overall employment growth (**9.9** percent) compared to all occupations nationally (**7.4** percent) between 2016 and 2026.
The water workforce in
Milwaukee-Waukesha-West Allis, WI

Metro area water employment, 2016
7,644
Rank: 44/100

Hourly wage distribution of the water workforce (■) versus all occupations (□), 2016

- 10th percentile hourly wage: $9.05
- 25th percentile: $12.00
- 50th percentile: $18.35
- 75th percentile: $34.48
- 90th percentile: $40.37

Ten largest water occupations by employment, 2016

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Jobs in water workforce</th>
<th>Share of all water workforce jobs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Plumbers, Pipefitters, and Steamfitters</td>
<td>1,355</td>
<td>17.7%</td>
</tr>
<tr>
<td>2. Construction Laborers</td>
<td>479</td>
<td>6.3%</td>
</tr>
<tr>
<td>3. Office Clerks, General</td>
<td>395</td>
<td>5.2%</td>
</tr>
<tr>
<td>4. Operating Engineers and Other Construction Equipment Operators</td>
<td>394</td>
<td>5.2%</td>
</tr>
<tr>
<td>5. Water and Wastewater Treatment Plant and System Operators</td>
<td>380</td>
<td>4.7%</td>
</tr>
<tr>
<td>6. Heating, Air Conditioning, and Refrigeration Installers</td>
<td>395</td>
<td>5.2%</td>
</tr>
<tr>
<td>7. First-Line Supervisors,erial Service Workers</td>
<td>395</td>
<td>5.2%</td>
</tr>
<tr>
<td>8. Helpers-Pipelayers and Pipeline System Installers</td>
<td>395</td>
<td>5.2%</td>
</tr>
<tr>
<td>9. Heavy and Tractor Operators</td>
<td>395</td>
<td>5.2%</td>
</tr>
<tr>
<td>10. Sheet Metal Workers</td>
<td>395</td>
<td>5.2%</td>
</tr>
</tbody>
</table>

U.S. Hourly Wage Comparison: Water Occupations vs. All Occupations, 2016

Source: Brookings analysis of BLS Occupational Employment Statistics
Baby Boomer Retirements Leave a Widening Employment Gap In Water Sector

Now retiring after 27 years as a water resources manager, Kathleen Cahall says they’re having difficulty filling her position

Why Young Workers Should Consider Jobs in the Water Sector

Renewing the nation’s infrastructure will require a sizable workforce, and jobs in the water sector pay well
Why is Diversity important?

How will my organization benefit from it?

Talent/Skills
- Education, military, farming, machining, engineers. Years of experience, location, cultural, personality etc.. All contribute to different ways to tackle a problem

Candidate Pool
- Extremely low unemployment and shortage of skilled trades candidates narrows the pool. Looking to more diverse candidates will expand the talent

Retention
- Changing job market creates mobility in staff. A welcoming, and inclusive workplace encourages employees to stay and grow with organization

Performance
- Higher morale and job satisfaction when allowed to express ideas; encourages managers to motivate employees in various ways
Why is Diversity important? How will my organization benefit from it?

- Community Relations
- Inclusivity
- Innovation
- Language and Culture
Case Study: Flint, Michigan: What Happened and Why?
Governor Snyder took office in 2011 and passed a tax break to corporations decreasing revenue for city. In 2014, Flint decided it was paying too much for water from Lake Huron by way of Detroit. They decided to construct their own pipe but would switch to a nearby lake in the interim. The lake water alone was NOT contaminated. An anti-corrosive was not added to the supply causing deterioration of lead pipes in homes.
Case Study: Flint, Michigan: The Facts

THE FLINT WATER CRISIS

The American city of Flint, Michigan, has been in the news recently due to the discovery of very high levels of lead in its water supply. But how did this lead get there? Here’s a brief explainer.

TRIHALOMETHANES

Disinfectant byproducts; formed by the reaction of chlorine (added to disinfect the water) with organic matter.

$X = \text{halogen (commonly } Cl \text{ or } Br)$

When high levels of trihalomethanes were detected in Flint’s water, ferric chloride ($\text{FeCl}_3$) was added to improve removal of organic matter. However, this increased the water’s already high concentration of chloride ions, and as a result made the water more corrosive.

CORROSION CONTROL

WITH PHOSPHATES

Orthophosphates are added to water to reduce the amount of lead leaching into it from pipes. They do this by forming a layer of low-solubility lead-phosphate complexes inside the pipe. This method of corrosion control was not used for the Flint River water supply.
GM complained about water quality and was switched back at the cost of the city.

At the same time residents complained but their source was not switched back.

An independent study found lead at various levels in residences.

Residents were on the tainted water for more than 20 months.

At least 12 people died after more than 80 people were infected with Legionnaires’ disease, which was also linked to the contaminated water.
Case Study: Flint, Michigan: The Facts

- The City of Flint, which has a population of around 100,000, is 57 percent black, 37 percent white, 4 percent Latino and 4 percent mixed-race.
- At least 41 percent of residents live below the federal poverty level.
- Median income of $24,862.
Case Study: Flint, Michigan: The Facts

- White flight to the suburbs contributed to today's situation in which a smaller and mostly black population struggles to maintain a water system built for a much larger city.
- Anti-corrosive additive would have cost about $100/day.
- "government, particularly state government, was slow to recognize the emergency," which "exacerbated the harm significantly.
- A government-appointed civil rights commission concluded there were not any specific violations of state civil rights laws, but says "historical, structural and systemic racism combined with implicit bias" played a role in the problems.
In the country’s largest metro areas, where the working-population tends to be much more diverse but is often enduring high levels of poverty and unemployment. From Detroit and St. Louis to Jacksonville and Orlando, for instance, thousands of water jobs are present, yet many residents, representing a variety of demographic and economic backgrounds, remain on the sidelines.
How can we impact change?

Workforce Policy Changes

Federal/State Level

Local Level

Employer Driven Changes
How can we impact change?

**Major Needs in Water Workforce Development**

- Acknowledge the varying scale and capacity of different communities—-and utilities across urban and rural areas in particular— to expand the water workforce opportunity.
- Emphasize that the water workforce needs greater public visibility, especially when trying to reach younger workers and other prospective job candidates.
- Consider barriers to support a more diverse water workforce, including the importance of looking for talent in places that may not traditionally have attracted as much attention.
- Investigate why identifying and hiring skilled workers remains a struggle for many utilities and other water employers, including the lack of proactive recruitment strategies.
- Note that the water sector includes employers, including municipalities, industries, and private organizations.

**Regional Actions**

- Develop a comprehensive water workforce plan, highlighting regional partnerships for additional collaboration.
- Establish a durable channel of funding to support these efforts, driven by community support.
- Encourage more diversity in support of minority and women businesses.
- Connect water workers and employers, serving as a simple job posting.
- Ensure that the water workforce plan is part of the overall infrastructure education, training, and credentialing.
Education & Awareness - Resources
https://www.epa.gov/sustainable-water-infrastructure/water-sector-workforce
How can we impact change?

Policy and Procedure Manual

How we actually do things because the manual was written by desk jockeys that live in a fantasy.
How can we impact change?

1. Utilities and other water employers need to empower staff, adjust existing procedures, and pilot new efforts in support of the water workforce

- Hire and train dedicated staff to meet with younger students, connect with more diverse prospective workers, and explore alternative recruitment strategies
- Create a new branding strategy to more effectively market the utility or organization to younger students and a broader pool of prospective workers
- Account for workforce needs as part of the budget and capital planning process, while creating more detailed and consistent labor metrics
- Update or create new job categories to provide greater flexibility for potential applicants
- Develop competency models—or customize existing models—to promote continued learning and skills development among staff
- Design and launch new bridge programs, including "water bootcamps," to provide ways for younger workers and other nontraditional workers to explore water careers and gain needed experience
- Implement a formalized mentorship program to provide interns and younger workers a clear point of contact and better monitor their career progression
What can I do?

- Mentoring
- Internships/Apprenticeships
- Succession Planning
- Education & Creating Awareness
- Broaden your Geography & Network
- Seek to Understand & Celebrate Individual Qualities
Millennials!

The millennial workforce is 2x that of GenX at 86M.

What’s important to millennials?

Making a positive impact. (Our biggest advantage in the water industry)

Flexibility.

One-on-one time with managers.

Perks.
In Summary...

Diversity is differences in race, gender, background, experience, education, etc.

Tangible benefits to encouraging diversity in YOUR workforce.

Up to 50% of water workforce will be retiring, creating a vacuum.

Diversity is the future of the workforce
Thank You

Any questions?